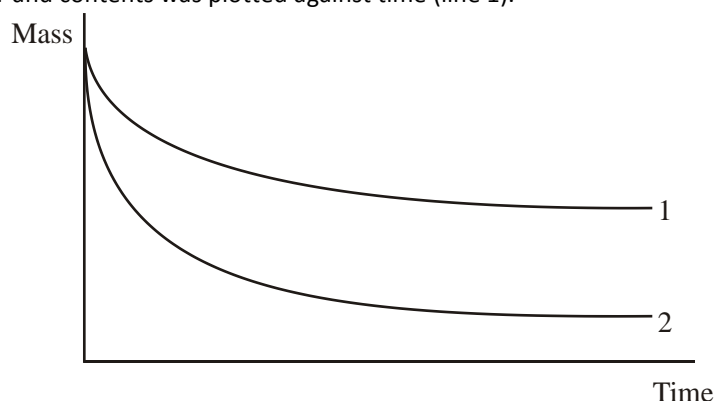


T06D08 – Kinetics SL IB Review

Name.....

1. Excess magnesium was added to a beaker of aqueous hydrochloric acid on a balance. A graph of the mass of the beaker and contents was plotted against time (line 1).



What change in the experiment could give line 2?

- I. The same mass of magnesium but in smaller pieces
 - II. The same volume of a more concentrated solution of hydrochloric acid
 - III. A lower temperature
- A. I only
B. II only
C. III only
D. None of the above
2. The rate of a reaction between two gases increases when the temperature is increased and a catalyst is added. Which statements are both correct for the effect of these changes on the reaction?

	Increasing the temperature	Adding a catalyst
A.	Collision frequency increases	Activation energy increases
B.	Activation energy increases	Activation energy does not change
C.	Activation energy does not change	Activation energy decreases
D.	Activation energy increases	Collision frequency increases

3. Which of the following is (are) altered when a liquid at its boiling point is converted to a gas at the same temperature?

- I. The size of the molecules
- II. The distance between the molecules
- III. The average kinetic energy of the molecules

- A. I only
B. II only
C. III only
D. I and II only
4. Which statement is correct with regard to the catalysed and uncatalysed pathways for a given reaction?
- A. The enthalpy change of the catalysed reaction is less than the enthalpy change for the uncatalysed reaction.
B. The enthalpy change of the catalysed reaction is greater than the enthalpy change for the uncatalysed reaction.
C. The enthalpy change of the catalysed reaction is equal to the enthalpy change for the uncatalysed reaction.
D. The activation energy of the catalysed reaction is greater than the activation energy for the uncatalysed reaction.

(Total 1 mark)

5. (i) Magnesium is added to a solution of hydrochloric acid. Sketch a graph of acid concentration on the y-axis against time on the x-axis to illustrate the progress of the reaction.

(1)

- (ii) Describe how the slope of the line changes with time.

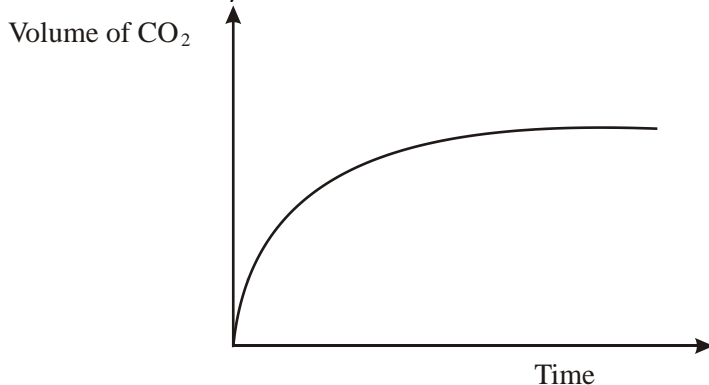
(1)

- (iii) Use the collision theory to state and explain the effect of decreasing concentration on the rate of the reaction.

(2)

(Total 4 marks)

6. The graph below shows the volume of carbon dioxide gas produced against time when excess calcium carbonate is added to $x \text{ cm}^3$ of 2.0 mol dm^{-3} hydrochloric acid.



- (i) Write a balanced equation for the reaction.

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(1)

- (ii) State and explain the change in the rate of reaction with time. Outline how you would determine the rate of the reaction at a particular time.

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(4)

- (iii) Sketch the above graph on an answer sheet. On the same graph, draw the curves you would expect if:

- I. the same volume ($x \text{ cm}^3$) of 1.0 mol dm^{-3} HCl is used.
II. double the volume ($2x \text{ cm}^3$) of 1.0 mol dm^{-3} HCl is used.
Label the curves and explain your answer in each case.

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(5)

(Total 10 marks)